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ABSTRACT

This publication is the final report of a 21-month project designed to (1) expand and refine the computer capabilities of the Vocational-Technical Education Consortium of States (V-TECS) to ensure rapid data access for generating routine and special occupational data-based reports; (2) develop and implement a computer storage and retrieval system to permit online revision and updating of V-TECS catalogs of performance objectives, criterion-referenced measures, and performance guides; and (3) conduct a feasibility study to determine the applicability of V-TECS materials for various target groups of handicapped learners. Focus in the report is on completion of the computer software and hardware systems, results and findings of the feasibility study, a recommended procedure for conducting future studies of applicability of V-TECS materials to handicapped learners, and the conduct of a project conference/symposium. (Author/BM)

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FINAL REPORT

A PROJECT TO COMPUTERIZE PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES IN OCCUPATIONAL EDUCATION FOR RESEARCH AND DETERMINATION OF APPLICABILITY TO HANDICAPPED LEARNERS

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ABSTRACT

This publication reports activities of a 21-month project designed to (1) expand and refine the computer capabilities of the Vocational-Technical Education Consortium of States (V-TECS) to ensure rapid data access for generating routine and special occupational data-based reports; (2) develop and implement a computer storage and retrieval system to permit on-line revision and updating of V-TECS catalogs of performance objectives, criterion-referenced measures and performance guides; and (3) conduct a feasibility study to determine the applicability of V-TECS materials for various target groups of handicapped learners.

A description of first year project activities is available in the interim project report. The interim report also contains a detailed set of appendices including examples of the computer reports generated, keypunching format instructions, and the instruments used in the feasibility study. This final project report focuses upon completion of the computer software and hardware systems, results and findings of the feasibility study, a recommended procedure for conducting future studies of applicability of V-TECS materials to handicapped learners, and the conduct of a project conference/symposium.

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I. INTRODUCTION

The Vocational-Technical Education Consortium of States (V-TECS) represents a cooperative effort between thirteen state divisions of vocational education; the U.S. Air Training Command, represented by the Community College of the Air Force; the U.S. Navy Education and Training Command; and the business, industry, and labor community for the development of catalogs of performance objectives and criterion-referenced measures. The thirteen member states are Alabama, Delaware, Florida, Georgia, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, South Carolina, Tennessee, and Virginia.

The primary goal of V-TECS is the development of catalogs of performance objectives, criterion-referenced measures, and performance guides. Each catalog is developed for a specific occupational domain area comprised of from two to five Dictionary of Occupational Job Titles (D.O.T.'s). A comprehensive V-TECS activity model is used to guide the development, dissemination, and implementation of the catalogs and to ensure transportability among member states. The performance objectives included in the catalogs are based upon data from current task surveys of incumbent workers and the criterion standards of performance are based upon actual job requirements.

In response to the continuing and immediate need for up-to-date, job-based materials for use in occupational training programs for all students, including the handicapped, V-TECS sought to undertake a project to accomplish the following: (1) Develop and implement a computer storage and retrieval system to facilitate the refinement, revision, and accessibility of the final catalogs; (2) Study the feasibility of adapting the catalogs for use in training handicapped persons and design a system for coding the performance objectives based on applicability for the handicapped; and (3) Conduct a conference concerning the scope of V-TECS and the implications of the research conducted during the project.

A. Objectives

The specific objectives were as follows:

1. Upgrade computer capabilities to ensure rapid data access for generating routine and special reports, revising and updating catalog content, and in meeting other computer service needs of requesting agencies.

2. Design and implement a computer coding system for storing performance objectives, criterion-referenced measures, and performance guides which will permit retrieval by job title, handicap code, commonality code, and other pertinent variables.

a. Develop computer format and procedural guidelines for data preparation.

b. Acquire necessary computer hardware to establish an on-line catalog revision and updating system.

c. Develop a computer program to retrieve performance objectives and associated criterion-referenced measures and performance guides by O.E. Code, Commonality Code, and other pertinent variables.

d. Operationalize a remote job-entry system to permit on-line catalog revision and updating.

3. Plan and conduct a feasibility study to determine and code those performance objectives that are appropriate for and attainable by various groups of handicapped learners.

4. Design a strategy for identifying and coding those performance objectives that are common to several related occupational domain areas.

5. Develop, plan, and conduct a conference for curriculum developers in the V-TECS states concerning the scope, use, implications, and dissemination of the catalogs.

B. Definition of Terms

1. Catalog. A comprehensive collection of performance objectives, performance guides, criterion-referenced measures, and related data organized by a job structure or career ladder within a domain of interest.

2. Criterion-Referenced Measure (CRM). An exercise based upon a performance objective and designed to measure attainment of that objective.

3. Domain. A cluster of related jobs.

4. D.O.T. Code. A nine-digit number used to identify a specific job within a given domain.[1]

5. Duty. One of the distinct major activities involved in the work performed comprising related tasks.

6. Handicapped. Those persons who are mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled or who have other health impairments requiring special education and related services. (1968 Amendments to the Vocational Education Act of 1963.)

7. Job. The duties and tasks actually performed by a specific individual.

8. Occupational Education. An organized sequence of learning experiences consisting of vocational theory, practice, and skill for students on a regular or systematic basis.[2]

9. Occupational Inventory. A listing of tasks to be performed in a particular occupational area, grouped under duty classifications. Also called "task list."

10. O.E. Code. A six-digit number used to identify a specific domain.

11. Performance-Based Instruction. Instruction which when properly designed and applied results in the learner's demonstration of certain psychomotor abilities. These desired abilities are clearly defined as observable, performance objectives before the instruction is designed.

12. Performance Guide (PG). A series of steps, arranged in a sequence ordinarily followed which when completed may result in the performance of a task.

13. Performance Objective (PO). A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

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[1] Also see Vocational Education and Occupations (July 1969) (Washington: Government Printing Office, Catalog FS5.280:80061, 1969)

[2] Standards of the Delegate Assembly (Atlanta: Southern Association of Colleges and Schools, Commission on Occupational Education, December, 1972), p. 12.

a. Condition. The testing situation confronting the learner is clearly specified. This includes equipment provided or withheld, environmental constraints such as temperature, space, etc.

b. Performance. The specific behavior expected of the learner is stated.

c. Standard. The degree of acceptable performance is specified. This may be quantitative, qualitative or both. If quantitative, 100% proficiency is assumed unless otherwise stated.. In the standard, "... locate shorts in an ignition system" it is assumed that all shorts must be located, compared to "... locate 3 of 4 shorts existing in an ignition system." If qualitative, the standard is explicitly stated; e.g., "... measure the bearing to within .005 of that found by the instructor." If the measure of quality is highly subjective, the instructor is assumed to be the judge of acceptable performance unless otherwise stated. This judgment may be made using a checklist or it may be strictly a "go-no-go" decision.

14. Project. An occupational domain area selected by a V-TECS member state for catalog development based upon the U.S. Department of Labor's Dictionary of Occupational Titles (D.O.T.) having a minimum of two and a maximum of five related D.O.T.'s.

15. Task. A unit of work activity or operation which constitutes a logical and necessary step in the performance of a duty.

16. Task Analysis. A process of reviewing actual job content and context in business and industry for application to the development of performance objectives, criterion-referenced measures, and quality control within a program of vocational-technical education.

17. Task Difficulty Index. An index used to determine the relative difficulty of each task performed within the domain of interest. This information is collected from selected workers and their immediate supervisors.

18. Task List. A listing of tasks performed by incumbent workers within a domain of interest. An example is a listing of all tasks performed by an automotive mechanic or by a worker in ornamental horticulture.

19. Task Time-Spent Index. An index of relative time-spent on each task within a domain of interest and appearing on a task list. The task time-spent index is computed from scientifically selected samples of incumbent workers who respond to task listings.

C. Summary of Progress First Twelve Months

An interim project report was prepared and submitted to the U.S. Department of Health, Education and Welfare, Office of Education, National Center for Educational Research and Development. This report describes the methods and procedures used and the progress made in accomplishing the project objectives during the period July 1, 1974 through June 30, 1975. Several preliminary findings with regard to the feasibility study of V-TECS catalog applicability for handicapped learners were provided. A detailed set of appendices was also provided including examples of standard computer reports, keypunching format guides, and the instruments used in the feasibility study. The progress made during this period of time is summarized below in terms of computer reports developed and documented, computer software, computer hardware, and planning for the feasibility study.

1. Computer Reports and Documentation. Upon receipt of the occupational inventory survey data, a total of 14 computer reports are generated for use by the V-TECS project personnel in completing the final catalog. The descriptive titles of these reports are as follows:

a. Time Spent Index by Project
b. D.O.T. Differential
c. Standard Deviations of Values
d. Duties and Tasks
e. Cumulative Time Spent by D.O.T.
f. Percentage by D.O.T.
g. Equipment
h. Random Number Generator

i. Instrument Reliability by Duty and Project

j. Task Difficulty Reliability by Workers/Supervisors for Appropriate Projects

k. Field Review Projects

l. Stanine Values by Cumulative Time by D.O.T.

m. Stanines by Tasks for Appropriate Task Difficulty Projects

Documentation was prepared on each of these 14 reports including a description of the Statistical Package for the Social Sciences (SPSS) sub-program utilized if appropriate. In addition, procedures for generating special statistical reports (i.e., "t-test", PERT, and DELPHI) were developed to meet the special needs of V-TECS member states. Detailed information on the content and uses of each of these reports is provided in the Interim Report.

2. Computer Software. Procedures for keypunching the survey and catalog data were developed and two independent data banks were established. The occupational inventory data bank is stored on disc and contains data from the occupational survey (and difficulty survey, if conducted) needed to generate a majority of the standard reports. It was determined that the final catalog data bank will contain a descriptive listing of performance objectives, criterion-referenced measures, and performance guides exactly as they appear in the final catalog. A computer program to load this information was written and checked out using simulated data. To facilitate development of the data retrieval program, instructions for creating a table that will allow each performance objective to be traced back to the original duty and task statements were prepared. Information in this table serves as a guide for cross-referencing between the two data banks, thus permitting data retrieval by the various mixtures desired.

3. Computer Hardware. In addition to the software refinements, computer hardware capabilities were expanded. An IBM 2770 remote computer processing terminal was installed in the V-TECS Central Office in Atlanta. The terminal consists of a 2772 Control Unit, a 2502 Card Reader, and a 2213 Printer. Arrangements were finalized to go on-line with the University of Georgia's Of-

fice of Computing Activities and thus have access to an IBM 360-65, an IBM 370-158, and a CDC 6400. In addition, an order was placed for a Cathode Ray Tube which will be used in conjunction with an IBM 3776 terminal on-line with the University of Georgia.

4. Feasibility Study of Catalog Applicability for Handicapped Learners. Several planning meetings with the ad hoc planning committee for the project and with the V-TECS technical coordinators were held. Prior studies and work relevant to the objectives of this project were sought through a review of the available professional literature and through contacts with selected organizations and individuals. In addition, existing information with regard to ongoing activities in vocational education and job opportunities for the handicapped in each of the six participating V-TECS states was secured and analyzed. These inputs were used to finalize plans and procedures for organizing the state review committees and structuring the committee work.

On the basis of the information collected and catalog availability, each state selected a handicapped target group and a catalog to be included in the feasibility study. The state selections are shown in Table 1.

TABLE 1

State Selections for U.S.O.E. Project

State	Handicap Target Group	V-TECS Catalogs
Alabama	Paraplegic	Radio/T.V. Repair
Florida	Deaf	Auto Body Repair
Georgia	Hard of Hearing	Data Processing
Kentucky	Educable Mentally Retarded	Cashier Checker
Mississippi	Educable Mentally Retarded	Landscape Gardening and Groundskeeping
Virginia	One-Arm Missing	Secretarial

Using pre-established criteria, the technical coordinators identified potential committee members and obtained committments. The composition of

each state committee, in terms of experience and backgrounds represented, is summarized in Table 2. Initial committee orientation and planning meetings were held in the states of Florida, Georgia, Kentucky, Mississippi, and Virginia and plans were finalized for conducting the first committee meeting in Alabama. A list of the committee members in each state and a copy of the data collection forms are provided in the Interim Report.

TABLE 2

Composition of State Committees

Committee Member	State					
	Al	Fl	Ga	Ky	Ms	Va
Handicapped Worker	1	1	1	1	1	1
Supervisor of Handicapped Workers		1	1	1	2	1
Vocational Rehabilitation	1	1	1	1	1	1
Vocational Education	1	1	3	3	2	1
Special Education	2	2	1	1	1	1
Veterans Administration	1		1			1
Vocational/Guidance Counselor		1	1	1	1	1
Occupational Specialist			2			2
V-TECS Technical Coordinator	1	1	1	1	1	1
TOTALS	7	8	12	9	9	10

D. Limitations

The fourth project objective was to design a strategy for identifying and coding those performance objectives that are common to several related occupational domain areas. The approach planned for accomplishing this project objective was to establish special committees in selected V-TECS states and to design procedures for reviewing the performance objectives in several re-

lated V-TECS catalogs to identify common performance objectives across catalogs. Then, based upon experiences from these reviews, a recommended strategy for determining commonality would be developed. Although several V-TECS states are in the process of developing catalogs in related occupational domain areas, the needed catalogs were, unfortunately, not compiled in time to permit implementation of the planned reviews.

E. Organization of Report

Emphasis in this report is upon describing project activities and accomplishments from July 1, 1975 through the duration of the project. A discussion of the results, findings, and recommendations are provided as appropriate, relative to the following activities:

a. Refinement of research procedures and computer software programs to generate a Bayesian Statistical report and other special requests.

b. Operationalizing a remote job-entry system for computer storage and retrieval of the final catalog.

c. Designing a strategy for determining and coding those performance objectives that are appropriate for and attainable by various groups of handicapped learners.

d. Conducting a conference for curriculum developers and special education specialists in the V-TECS member states concerning the scope of V-TECS and the implications of the research conducted during this project.

II. RESULTS AND FINDINGS

This section describes accomplishments from July 1, 1975 in developing and implementing special statistical computer reports and in establishing the computer software and hardware required to operationalize the remote job-entry system for storing and retrieving V-TECS final catalogs. In addition, results and findings from the feasibility study of catalog applicability for handicapped learners are presented.

A. Special Statistical Computer Reports

In response to the continuous growth of individualized computer requests and based upon the V-TECS projected growth, additional statistical research reports have been refined and documentation updated. A complete list of V-TECS computer reports, as of June 30, 1975, is documented in the interim project report. Among research reports developed, perhaps with the greatest potential use are the Bayesian Statistical Report and the Chi-Square Commonality Report.

The Bayesian Statistical Report is a report that computes the total utility of each task within a project in terms of four variables. They are: 1) time spent, 2) task difficulty, 3) number of persons performing, and 4) the time period when the task is performed on the job. Tasks are then sequenced from high to low utility based upon these four variables. An example of this report (completed on V-TECS Project 1125 Cosmetologist) is included in Appendix A. One major advantage of this report, when adopted by V-TECS Board of Directors, is that it will supplement and/or supplant many of the standard reports currently being produced. Another advantage is that it will aid decision-makers, writing team members, and others when converting tasks (based upon occupational data) into performance objectives, criterion-referenced measures, and performance guides. Still another advantage is that the Bayesian Statistical Report will reduce data processing costs.

A second special statistical computer report is the Chi-Square Commonality Report. This report was developed and implemented to determine common tasks among two or more D.O.T.'s. Implementation of this technique was completed on V-TECS Project 1299 Housing Managers which contained five D.O.T.'s. On this report common tasks are not only identified but the degree of commonality is established with a level of confidence.

B. Remote Job-Entry System for Storing and Retrieving V-TECS Final Catalogs

1. Computer Software System. V-TECS computer objectives (application programs) have been completed to the extent that final catalogs/individualized performance objectives, criterion-referenced measures, and performance guides can be retrieved and printed (already stored on disc those catalogs that have been completed) by O.E. Code, D.O.T.(s), Handicapped Code(s), Commonality Code, and other mixtures or combinations of pertinent variables. However, a sub-objective of V-TECS (a refinement of the objectives in the U.S.O.E. Project 1975) is to print out camera ready copies of performance objectives, criterion-referenced measures, and performance guides using the computer printer. Therefore, special parameters such as quality of paper, Campbell's format ... dissertation style, upper and lower case letters, and other special characters etc. had to be programmed. Thus the complete remote job-entry system for revising and updating V-TECS catalogs will be accomplished using computer software packages such as Time Sharing Options (TSO), and Customer Information Control System (CICS), and other V-TECS application programs in conjunction with the cathode ray tube. The cathode ray tube is the device that will enable V-TECS to retrieve, display, revise, delete, and store final catalogs/individualized performance objectives, criterion-referenced measures and performance guides almost instantaneously. Other applications programs will then enable V-TECS to print out camera-ready copies of performance objectives, criterion-referenced measures and performance guides using Campbell's format dissertation style.

At the present time, approximately 80% of all computer software has been developed and implemented for storing and retrieving performance objectives, criterion-referenced measures and performance guides on line using the cathode ray tube and/or computer printer.

2. Computer Hardware System. In addition to the software refinements, computer hardware capabilities were expanded. On January 6, 1976, an IBM-3776 remote data processing terminal was installed in the V-TECS Central Office in Atlanta. The terminal replaced the IBM 2770 unit. Also, an IBM 3275 Cathode Ray Tube was installed and checked out on February 19, 1976. Other hardware and software arrangements have been finalized with the University of Georgia's Office of Computing Activities to have access to the IBM 360-65, an IBM 370-158, and the

Cyber 70. An example of V-TECS expanded and efficient remote-job entry system is expressed in terms of the 325 special reports generated during the first quarter of 1976.

C. Feasibility Study of Catalog Applicability for Handicapped Learners

1. Overview of Committee Meetings. Each of the six participating states held two committee meetings. The first meeting served as a general orientation and planning for each state committee. Following feedback from the first four state committee meetings, the rating instructions and response forms were finalized and mailed to the committee members. These finalized materials were made available to the remaining two state committees during their first meeting. The purpose of the second committee meeting was to discuss progress made in completing the work and any problems or concerns encountered. A majority of the committee members submitted their completed response forms at this second meeting. The dates of these activities are shown in Table 3.

TABLE 3

Timetable for State Committee Meetings

State	First Meeting	Response Forms Distributed	Second Meeting
Al	8/13/75	8/13/75	9/17/75
Fl	6/25/75	7/9/75*	7/26/75
Ga	7/30/75	7/30/75	8/19/75
Ky	6/11/75	7/3/75*	8/12/75
Ms	6/24/75	7/8/75*	8/2/75
Va	6/23/75	7/7/75*	7/21/75

*Mailed

During the first meeting each state committee reached concensus on an operational definition of the handicapped target group under study (see Appendix B) and discussed specific procedures for completing the committee work. Several key points were brought out during these meetings.

First, the committees reviewed existing definitions used by vocational education, special education, and vocational rehabilitation and other factors felt

to be important by the committee members based upon their backgrounds and experiences in working with the handicapped. The discussions revealed that the handicapped target group most difficult to delimit is the mentally retarded. As shown in Appendix B, the Kentucky committee chose to consider two different levels of educable mentally retarded persons defined as "upper-level" and "lower-level" EMR's, whereas, the Mississippi committee did not feel that it was necessary to make this distinction.

Second, the committees discussed some of the more prevalent issues and opinions regarding the capabilities and limitations of the handicapped target groups. For example, the available data on the effects of noise on hearing levels appears to be inconclusive. On one hand, the Florida committee felt that deaf persons would be extremely sensitive to and bothered by the noise level in an auto body shop, whereas, the Georgia committee felt that the hard of hearing would be especially suited to working in a data processing environment in that they would be insensitive to the surrounding noise. Thus, it proved important to examine existing assumptions in light of current knowledge about the handicapping condition and the nature of the occupation under study.

Third, the committee members agreed to rate the performance objectives in the selected catalog for applicability to the identified handicapped target group. If time permitted, they also agreed to rate the tasks in the associated occupational inventory prior to rating the objectives. Several committee members pointed out that it is not uncommon for handicapped persons to have multiple handicapping conditions and that this factor might influence the ratings. In dealing with this concern, it was agreed that all ratings should be made based upon the assumption that only the handicapping condition as defined by each committee would effect performance.

2. Respondents Background Information. Each committee member was requested to provide several types of data consisting of background information, and ratings of task performance, task difficulty, and applicability of the performance objectives to the identified handicapped target group. Copies of the instruments used are provided in the Interim Report.

The Background Information Form contained three parts and was completed by each committee member except the worker. Part I was used to obtain the name,

Job title, and mailing address of each committee member. Part II served to obtain selected background information about the respondents and Part III was used to obtain information on time and effort required to complete the committee work. A total of 43 completed forms were returned although not every respondent answered every question. Selected background information about the workers is included in Appendix C.

Tables 4 through 7 provide descriptions of the backgrounds and experiences of the committee members based upon responses to the following questions in Part II:

a. How many years of experience have you had in working with and/or providing services for handicapped persons? ___ Years

b. What is your primary area of specialization? (check one)

c. In what type of work setting are you employed? (check one)

d. What is the age range of the handicapped population you primarily work with? ___ to ___ years

TABLE 4

Number of Respondents by
Years of Experience Working With Handicapped

Years of Experience	State					
	Al	Fl	Ga	Ky	Ms	Va
0			2	1		
1-5	2	1	1		3	1
6-10		2	4	3	2	3
11-15	3		1			1
16-20	1		1	1	1	1
21 or more		2		1		1
Range (Yrs)	2-20	2-30	0-20	0-40	4-17	5-26
Median (Yrs)	14	15.3	7	8.67	5.5	10.5

TABLE 5

Number of Respondents by
Primary Area of Specialization

Area of Specialization	State					
	Al	Fl	Ga	Ky	Ms	Va
Supervisor			1	1		
Administration			1	4	1	5
Consultant		2	1			
Curriculum Spec.	2			2		
Special Education Teacher	1				2	
Vocational Education Teacher		1	4		1	1
Vocational Guidance Counselor				1	1	
Vocational Rehab. Specialist	3	2	3		1	2

TABLE 6

Number of Respondents by Work Setting

Work Setting	State					
	Al	Fl	Ga	Ky	Ms	Va
Rehab. Center						3
State School for Handicapped		1			1	
State Department						
- Spec. Ed.	2	1	1	2	1	1
- Vet. Admin.			1			1
- Voc. Rehab.	2	2	2	1	1	2
- Voc.-Tech. Ed.	2	1	2	3	1	1
Others*			4	2	2	

*Includes college or university; post-secondary school; and private business, industry, or foundation.

TABLE 7

Number of Respondents by
Age Range of Handicapped Population Worked With

Age Range	State					
	Al	Fl	Ga	Ky	Ms	Va
Infant-Adolescent	1	1	1	1		1
Infant-Elderly			1			
Adolescent-Young adult	2	1		2	3	3
Adolescent-Elderly	1	3	5	3	2	2
Young adult-Elderly	2		2		1	1

An examination of the data in Tables 4 through 7, across states, reveals the following:

a. The range of experience working with handicapped persons most frequently indicated was 6-10 years;

b. The primary areas of specialization checked most often were administration and vocational rehabilitation specialist;

c. A majority of the committee members worked in the state department and primarily in the divisions of vocational technical education and vocational rehabilitation; and

d. A majority of the committee members worked with handicapped groups at the secondary and post-secondary levels.

The final question in Part II of the Background Information Form was: "What types of handicapping conditions are you most knowledgeable about?" The specific responses are included in Appendix D. Almost all of the respondents listed more than one handicapping condition and several indicated knowledge of all types of physical and mental handicapping conditions. Only a few respondents indicated limited knowledge of the handicapping condition under study.

In conclusion, the responses indicated that both within and across states the committee members had a great deal of experience in working with handicapped persons of all ages and were knowledgeable about a wide variety of handicapping conditions.

3. Data on Applicability of Tasks. In rating the tasks in the occupational inventory booklet, the committee members were instructed to 1) place a checkmark opposite those tasks that they felt could be performed by persons having the specified handicapping condition, and 2) rate the difficulty of performing each task checked using the following scale:

Scale Value	Definition
1	Not Difficult at all. Essentially the same amount of physical and/or mental effort would be required of persons having no handicapping condition.
2	Fairly Difficult. Slightly less physical and/or mental effort would be required of persons having no handicapping condition.
3	Very Difficult. A great deal less physical and/or mental effort would be required of persons having no handicapping condition.
4	Extremely Difficult. Persons having the specified handicapping condition can perform the task only if they are highly motivated and special assistance or supportive aids are provided.

The above instructions were slightly modified to obtain worker input. Workers were instructed to 1) place a checkmark opposite those tasks that

they performed in their present job, 2) place an X opposite those tasks that they do not currently perform but could perform if required to do so, and 3) rate the difficulty of each task indicated attainable using the following scale:

Scale Value	Meaning
1	Not Difficult at all
2	Fairly Difficult
3	Very Difficult
4	Extremely Difficult

Table 8 shows the number of usable returns by state and the response rates. Although the V-TECS Technical Coordinators were not required to rate the occupational inventory for handicapped applicability, the Coordinators from Alabama and Kentucky had some experience in working with the handicapped and chose to submit ratings. These two returns were not counted in calculating the response rates, however, their responses were otherwise included.

TABLE 8

Number of Usable Returns:
Occupational Inventory Task Ratings

Respondent	State					
	Al	Fl	Ga	Ky	Ms	Va
Worker	1		1	1		1
Supervisor		1	1	1	1	1
Other	6	4	6	7	5	7
Totals	7	5	8	9	6	9
% Response	100	71	73	100	75	100

Limitations. A total of 44 usable responses were obtained. Input was obtained from four workers and five supervisors. Alabama could not locate a suitable representative of the supervisor group to serve on the committee.

Although Florida identified a deaf worker to serve on the committee and attend the first meeting, the worker failed to complete the work. This situation probably represents an example of the "communications" problem with the deaf initially stressed by the committee members. An additional problem was the fact that the V-TECS Technical Coordinator and the worker were located in different cities. No other suitable handicapped worker could be located to serve within the alloted time frame. The Kentucky Technical Coordinator worked individually with the EMR worker and the supervisor, using an oral question and answer technique, to elicit and record their task ratings but due to the time involved chose not to attempt to obtain catalog ratings from them. A similar questioning technique was used by the Mississippi Technical Coordinator with assistance from the supervisor on the committee to obtain responses to the performance objectives in the catalog from the Mississippi EMR worker in lieu of obtaining task ratings from the worker. The remaining "no responses" on the occupational inventory resulted because of busy schedules on the part of the respective committee members.

An analysis of the responses revealed that practically all of the committee members rated an overwhelming majority of the tasks as attainable and "not difficult at all" for the various handicapped target groups under study. No tasks were rated by a majority of the committee members as being unattainable or unusually difficult to perform. Thus, it would appear that persons having the identified handicapping conditions would have no difficulty performing the specified tasks as stated in the occupational inventories used.

4. Data on Applicability of Performance Objectives. In assessing the performance objectives in the catalogs, the committee members were instructed to analyze and rate each performance objective in relation to the specified behavior, conditions, and standards using the following response scale:

Response	Definition
No	The specified behavioral skill cannot be performed as stated.
Conditional Yes	The behavioral skill can be performed if the conditions or standards speci-

fied in the performance objective are slightly modified.

Yes . . . . . The specified behavioral skill can be performed as stated.

Comments as to the specific modifications needed were requested for each "No" or "Conditional Yes" response.

Table 9 shows the number of usable returns by state and the response rates. Again, completed returns from the two V-TECS Technical Coordinators were not counted in computing the response rates but were otherwise included in the analysis of data.

TABLE 9

Number of Usable Returns:
Catalog Performance Objective Ratings

Respondent	State					
	Al	Fl	Ga	Ky	Ms	Va
Worker	1		1		1	1
Supervisor		1	1		1	1
Others	6	4	9	7	5	7
Totals	7	5	11	7	7	9
% Response	100	71	100	75	86	100

Limitations. A total of 46 usable responses were obtained. Input was obtained from four workers and four supervisors. The limitations discussed above for the occupational inventory also apply for the catalog ratings. In addition, during the first committee meeting, most of the committee members felt that it would be inappropriate to rate the performance objectives identified as supervisory in nature for applicability to handicapped learners. Thus, supervisory P.O.'s were not rated except in the state of Mississippi. Finally, most of the states used the "field review" version of the catalogs for rating purposes due to the fact that the final catalogs were not yet available.

In analyzing the data from each state, the responses were tallied and each performance objective was listed under one of the following three categories: (1) Can Not Perform, (2) Can Perform, Conditionally and (3) Can Perform, Unconditionally. If a majority of the committee members checked "No", the P.O. was listed under the first category. If a majority of the committee members checked "Yes", the P.O. was listed under the third category. The remaining P.O.'s were listed under the middle category. Extensive comments indicating the specific modifications needed, were provided for most of the P.O.'s rated "No" or "Conditional Yes". Table 10 provides a summary of the findings.

The results shown in Table 10 should be interpreted with caution due to the small overall sample sizes, the limited input from workers, and the fact that the committee members did not have the opportunity to study these preliminary results and attempt to reach concensus on the ratings.

With the above mentioned precautions and limitations in mind, a review of the data in Table 10 reveals that with only one exception less than nine percent of the non-supervisory performance objectives in each catalog reviewed were judged to be unattainable by the handicapped target groups studied. The one exception occurred in the Kentucky review where 60 percent of the P.O.s were rated unattainable by lower-level EMRs. In fact, none of the P.O.s in the catalogs reviewed by the Florida, Georgia, and Virginia committees were judged to be unattainable by the deaf, hard of hearing, and one-arm missing handicapped target groups respectively. The 13 P.O.s judged by the Alabama committee to be unattainable by the paraplegic were so rated primarily due to the problems that would be encountered in physical mobility.

The data in Table 10 also reveals that the physically handicapped target groups studied (i.e., the paraplegic, deaf, hard of hearing, and one-arm missing) were judged to be capable of attaining at least 89 percent of the P.O.s as stated in the respective catalogs. With regard to the mentally handicapped, slightly over one-half of the P.O.s reviewed by the Kentucky committee were rated attainable as stated by persons classified as upper-level EMRs. However, lower-level EMRs were judged to be able to attain only about seven percent of the P.O.s as stated in the Kentucky catalog. Considering the total range of EMRs, it was

TABLE 10

Number and Percentage of
Non-Supervisory Performance Objectives
Rated Applicable to Handicapped Learners

State	Catalog	Handicapped Target Group	Cannot Perform		Can Perform			
					Cond.		Uncond.	
			N	%	N	%	N	%
Al	Radio/T.V.	Paraplegic	13	8	5	3	152	89
Fl	Auto Body	Deaf	0	0	0	0	37	100
Ga	Data Processing	Hard of Hearing	0	0	4	3	116	97
Ky	Cashier Checker	EMRs - Upper level	1	2	18	42	24	56
		EMRs - Lower level	26	60	14	33	3	7
Ms	Landscape	EMRs	7	6	66	57	42	37
Va	Secretarial	One-Arm Missing	0	0	1	1	103	99

judged that about 37 percent of the P.O.'s in the Mississippi catalog were attainable as stated.

An analysis of the comments provided by the committee members revealed that a majority of the reservations relative to attainment of the P.O.'s by the various handicapped target groups were with regard to the specified conditions and standards. For example, commehts by the Mississippi committee indicated that attainment of the 66 P.O.'s rated "Conditional Yes" by a majority would be possible if the stated conditions of the P.O.'s specified close supervision of the worker and/or verbal rather than written instructions where needed. This conclusion was reiterated by the Mississippi committee members during their second meeting. At this meeting they also suggested that more supervisors should be included on future committees and that the capabilities of EMR's under consideration should be more clearly spelled out prior to attempting to rate future catalogs. In general, comments provided by the Kentucky committee indicated that the situational standards specified in the P.O.'s rated "Conditional Yes" by a majority would have to be simplified to reduce the number of judgments required of the EMR worker.

Comments were also provided for some P.O.'s given an unconditional "Yes" rating by a majority that suggest a need for reexamining the P.O.'s for possible revision of the conditions or standards. For example, approximately one-fourth of the P.O.'s given an unconditional "Yes" rating by the Virginia committee were indicated by some committee members as requiring a great deal more time to perform or as being somewhat more difficult for persons having one-arm missing.

In summary, the results of the catalog review indicate that at least 89 percent of the P.O.'s in each catalog reviewed were judged to be attainable as stated by persons having the defined physical handicapping condition. However, 60 percent of the P.O.'s in the Kentucky catalog were judged to be unattainable by lower-level EMR's. In general, when considering the total range of persons classified as EMR, extensive modification of a majority of the P.O.'s in the Mississippi catalog would be required to permit attainment by EMR's.

5. Estimates of Time and Effort Required to Complete the Committee Work. Part III of the Background Information Form was used to obtain information relative to the following questions:

a. Approximately how much time did you spend analyzing and rating the tasks in the Occupational Inventory? ___ Hours

b. Approximately how much time did you spend analyzing and rating the performance objectives in the catalog? __Hours

c. In completing your committee work, what procedures did you use, if any, to acquire additional information about the occupational area and/or the specific handicapped target population? (Briefly list backgrounds of persons consulted, on-site visits, references used, etc. and for what purpose).

An examination of the data in Table 11 reveals that the individual times spent rating tasks, across states, ranged from one-half an hour to eight hours and that the average time spent ranged from 1.4 to 2.5 hours. From inspection, there appears to be no definite relationship between "number of tasks" and "amount of time" spent.

TABLE 11

Time Spent (in Hours) Rating Tasks

State	Tasks Rated	Time Range	Avg. Time
	N	Hrs	Hrs
Al	301	1-2	1.6
Fl	76	0.5-4	1.9
Ga	203	1-3	1.8
Ky	71*	1-5	2.5
Ms	215	2-8	4.3
Va	453	0.5-2.5	1.4

*The 71 tasks in the Kentucky inventory were rated twice - once for lower-level EMRs and again for upper-level EMRs

An examination of the data in Table 12 reveals that the individual times spent rating performance objectives, across states, ranged from one-half an hour to twenty hours and that the average time spent ranged from 2.0 to 6.7 hours. Again, based upon the computed average times by state, there appears to be no definite relationship between "number of performance objectives" and "amount of time" spent. However, the averages for the states of Alabama, Florida, and

TABLE 12

Time Spent (in Hours) Rating Performance Objectives

State	POs Rated	Time Range	Avg. Time
	N	Hrs	Hrs
Al	170	2-10	4.9
Fl	37	1-20	5.6
Ga	120	2-8	3.6
Ky	43*	2-7	4.3
Ms	161	2-18	6.7
Va	104	0.5-4	2

* The 43 POs in the Kentucky catalog were rated twice - once for lower-level EMRs and again for upper-level EMRs

Mississippi were inflated because untypically high times were reported by at least one committee member from each of these states. It appears that these committee members added the time spent seeking additional information about the occupation and/or handicapped target groups to the actual rating time spent.

Specific responses to the last question in Part III of the Background Information Form are provided in Appendix E. The responses indicate that quite a few of the committee members sought additional information prior to completing their ratings. Those committee members unfamiliar with the occupational area under study interviewed and/or observed incumbent workers; consulted supervisors, training officers, and/or instructors; or did library research to learn more about the occupation. Some committee members consulted with vocational rehabilitation counselors and/or visited various rehabilitation centers to acquire more information about the handicapping condition under study.

D. Project Conference/Symposium

Plans were made to conduct a one-day conference/symposium to present and discuss the results, findings, and recommendations resulting from the project conducted by V-TECS and funded by the U.S. Office of Education.

Participants were invited through a letter of invitation mailed to each of the State Directors of Vocational Education in the 13 V-TECS member states. The V-TECS Technical Coordinator and a person having prime statewide responsibility for vocational education of handicapped learners were invited to attend the symposium at V-TECS expense. Attendance by other interested persons in the state was welcomed. Letters of invitation were also sent to the U.S.O.E. Regional Program Officer for Occupational and Adult Education in Atlanta and the Assistant Regional Representative for Rehabilitation Services in Atlanta both of whom provided valuable assistance and information throughout the project. Pre-addressed postcards were enclosed with each letter to confirm attendance. An example of the letters of invitation sent are provided in Appendix F.

The meeting was held on March 26, 1976, with 22 persons attending. Twelve of the 13 V-TECS member states were represented. A copy of the agenda and detailed minutes of the conference/symposium (including a list of persons attending) is provided in Appendix G.

Results of the research and development accomplished as a result of project funding were presented and discussed. The broad topics covered were V-TECS purposes and procedures, computer software, computer hardware, findings from the feasibility study, and recommendations for conducting future studies of applicability of V-TECS catalogs to handicapped learners.

As a result of project funding, 14 standard computer reports are currently generated for each V-TECS project. In addition, procedures for computing a task difficulty index, a time spent index, and stanine values were refined and associated computer reports developed. Documentation was prepared on each of these reports. The necessary computer programs and hardware for storing and retrieving V-TECS catalogs on the cathode ray tube and computer printer will be operationalized by mid-June.

Also, as a result of project funding, the use of specialized review committees was demonstrated to be an effective and feasible approach for determining the applicability of V-TECS catalogs to handicapped learners. On the basis of experiences and findings from six state committee reviews, a recommended procedure for conducting future applicability studies was finalized.

III. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. Summary

Data from the surveys of incumbent workers and the final catalogs completed to date by each V-TECS project are currently stored on disc. Standardized keypunching formats were developed and detailed instructions for the preparation and submittal of the necessary data decks were finalized and implemented. Computer software programs for generating 14 standard computer reports (based upon the survey data) and for generating special computer reports, as requested, were refined, documented, and implemented.

Arrangements have been finalized with the University of Georgia's Office of Computing Activities to have access to an IBM 360-65, an IBM 370-158, and the Cyber 70. An IBM 3776 remote data processing terminal was installed in the V-TECS Central Office in Atlanta and is now operational. An IBM 3275 Cathode Ray Tube was also installed and checked out.

Approximately 80 percent of the required computer software has been developed and implemented for storing and retrieving the final catalogs of performance objectives, criterion-referenced measures, and performance guides on-line using the cathode ray tube and/or computer printer. It is anticipated that the remote job entry system will be fully operationalized by mid-June of this year.

Feasibility studies for determining those performance objectives that are appropriate for and attainable by various target groups of handicapped learners were conducted in six V-TECS member states. Special committees, ranging in size from seven to twelve members were established in each state composed of a handicapped worker where possible, a supervisor where possible, persons knowledgeable of the limitations and capabilities of handicapped learners, and persons knowledgeable of the occupation under study.

Standardized rating instructions and response forms were developed and provided. Each committee member was charged with the responsibility of rating each task in the selected V-TECS occupational inventory for attainability and difficulty and each performance objective in the associated V-TECS catalog for attainability by the selected handicapped target group. The usable returns, as well as informal feedback provided by the committee members, were analyzed

and used to develop a recommended procedure for conducting future studies and for coding performance objectives relative to applicability for various handicapped target groups.

A conference/symposium for persons having statewide responsibility for handicapped learners, curriculum developers, and other interested persons was held. Representatives from each of the 13 V-TECS member states were invited to attend. A total of 22 persons attended representing 12 of the 13 V-TECS member states. The purposes of this meeting were: (1) to explain the overall scope, procedures, and products of V-TECS, and (2) to present and discuss the results, findings, and recommendations emerging from the conduct of this project.

B. Conclusions

Based upon the research and development completed to accomplish the stated project objectives, the following conclusions were drawn:

1. A remote job-entry system is and efficient and effective computer system to:
   (a) ensure rapid data access for generating routine and special occupational data-based reports,
   (b) type final catalogs according to Campbell's format - dissertation style using the cathode ray tube, and
   (c) permit on-line revision and updating of V-TECS catalogs of performance objectives, criterion-referenced measures, and performance guides.
2. Implementation of a committee approach to determine the applicability of V-TECS materials to various groups of handicapped learners is:
   (a) both practical and feasible, and
   (b) more effective (that is, yields more in-depth and useful information relative to needed modifications) when an assessment of the performance objectives, rather than just the tasks, is made.

C. Recommendations

Based upon informal feedback from the committee members and the overall results of the feasibility study, a recommended procedure for conducting future state studies of V-TECS catalogs for applicability to handicapped learners was developed. This procedure consists of 12 activity steps as shown in Figure 1. A narrative description of each activity is provided below.

ACTIVITY 1: ANALYZE AVAILABLE DATA

- Types of Data:
  - Estimates of Handicapped Target Populations
  - Activities in Vocational Education for the Handicapped
  - Enrollments and Completions of Handicapped Students in Vocational Education Programs
  - Employment Outlook and Placement of Handicapped Persons
  - Training Available in Special State Schools, Sheltered Workshops, and Vocational Rehabilitation Centers for the Handicapped
- Sources of Data:
  - State Plan for the Administration of Vocational Education
  - Annual Vocational Education Reports
  - Veterans Administration
  - State Department: Vocational Rehabilitation
  - State Department: Special Education
  - West Virginia Rehabilitation Center, Research and Training Center in Institute, West Virginia

ACTIVITY 2: SELECT STATE PROJECT(S)

- Based on data from Activity 1 and catalog availability.

ACTIVITY 3: SELECT HANDICAPPED TARGET GROUP(S) FOR STUDY

- Based on Activities 1 and 2.
- Definition of handicapped persons as specified in the 1968 Amendments to the Vocational Education Act of 1963:
  - Crippled
  - Deaf
  - Hard of Hearing
  - Mentally Retarded
  - Seriously Emotionally Disturbed
  - Speech Impaired
  - Visually Handicapped

RECOMMENDED PROCEDURE FOR CONDUCTING FUTURE APPLICABILITY STUDIES FOR HANDICAPPED LEARNERS

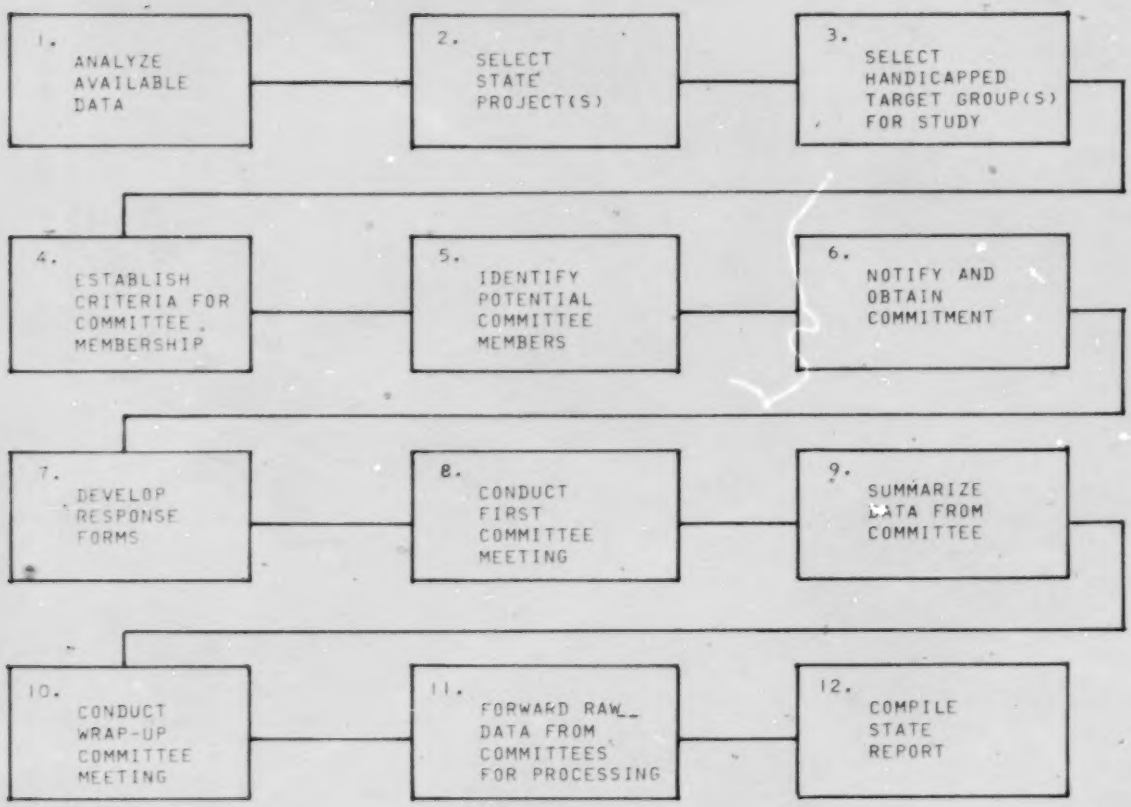
1. ANALYZE AVAILABLE DATA
2. SELECT STATE PROJECT(S)
3. SELECT HANDICAPPED TARGET GROUP(S) FOR STUDY
4. ESTABLISH CRITERIA FOR COMMITTEE MEMBERSHIP
5. IDENTIFY POTENTIAL COMMITTEE MEMBERS
6. NOTIFY AND OBTAIN COMMITMENT
7. DEVELOP RESPONSE FORMS
8. CONDUCT FIRST COMMITTEE MEETING
9. SUMMARIZE DATA FROM COMMITTEE
10. CONDUCT WRAP-UP COMMITTEE MEETING
11. FORWARD RAW DATA FROM COMMITTEES FOR PROCESSING
12. COMPILE STATE REPORT

Figure 1

ACTIVITY 4: ESTABLISH CRITERIA FOR COMMITTEE MEMBERSHIP

- Establish a sufficient committee size to obtain at least seven independent ratings
- Select representatives from the following areas:
  - Handicapped Worker in the Selected Occupational Area
  - Supervisor of Handicapped Workers
  - Vocational Rehabilitation
  - Vocational-Technical Education
  - Special Education
  - Veterans Administration
  - Vocational Guidance and Counseling
- Include a minimum of five handicapped workers
- Ratings must be based upon:
  - Knowledge of the capabilities and limitations of persons having the specified handicapping condition(s), and
  - Knowledge of the catalog job content.

ACTIVITY 5: IDENTIFY POTENTIAL COMMITTEE MEMBERS

- Contacts by phone or letter:
  - Vocational Rehabilitation Center, Training Director
  - Vocational Rehabilitation, Regional or State Director
  - Special Education, State or Local Representative
  - Vocational Education, State Department
  - Veterans Administration, Regional Office

ACTIVITY 6: NOTIFY AND OBTAIN COMMITMENT

ACTIVITY 7: DEVELOP RESPONSE FORMS

- Background Information
- Rating Instructions and Rating Forms

ACTIVITY 8: CONDUCT FIRST COMMITTEE MEETING

- Reach concensus on an operational definition of the handicapped target group under study. This will be especially difficult when defining the mentally handicapped, thus, suggest that some preliminary thought be given prior to the meeting.

- Discuss the advantages of committee members working in pairs or pairing up with some one outside the committee to enhance the validity of the ratings.

- Discuss the rating instructions and forms to be completed.

- Set dates for as many additional meetings as felt to be necessary.

ACTIVITY 9: SUMMARIZE DATA

- Tally ratings.

- List P.O.'s rated unconditional "Yes" by a majority and any significant comments relative to the conditions or standards.

- List P.O.'s rated "No" by a majority and the comments.

- List remaining P.O.'s (conditional ratings) and the comments.

- Flag the P.O.'s that appear to need further examination.

ACTIVITY 10: CONDUCT WRAP-UP COMMITTEE MEETING

- Present and discuss results.

- Change ratings where agreed upon.

ACTIVITY 11: FORWARD RAW DATA FROM COMMITTEES FOR PROCESSING

- Objectives will be coded on the computer in terms of applicability to various handicapped target groups.

- Catalogs may be studied for applicability to several different handicapped target groups. Twenty card columns have been set aside to code the specific handicapped groups studied.

- Based upon the results of future applicability studies, each performance objective reviewed will be coded as follows:

Code	Definition
1	Applicable as stated.
2	Applicable with modifications.
3	Not applicable.

ACTIVITY 12: COMPILE STATE REPORT

- Document procedures and results.

APPENDICES

APPENDIX A

EXAMPLE OF THE BAYESIAN STATISTICAL COMPUTER REPORT

ALABAMA PROJECT 1125

COSMETOLOGIST

	Duty/ Task	Cum. No.	Task Description	Tutil	TS	TD	PM	YOJ
47	G01	047	GIVE A COLD WAVE	9	9.	9.	9.	3.
22	D01	022	GIVE A SCISSOR CUT	9	8.	9.	9.	3.
35	E05	035	COMB HAIR INTO STYLE	9	9.	8.	9.	3.
24	D03	024	LAYER-CUT HAIR	8	8.	8.	9.	3.
27	D06	027	TAPER HAIR	8	8.	8.	9.	3.
23	D02	023	GIVE A RAZOR CUT	8	8.	7.	9.	3.
34	E04	034	MAKE ROLLER CURLS	8	9.	6.	9.	3.
42	F05	042	APPLY PERMANENT HAIR TINT	8	7.	7.	9.	3.
45	F08	045	APPLY BLEACH FOR TOUCH-UPS	8	6.	9.	8.	3.
17	C01	017	GIVE PLAIN SHAMPOO	7	9.	6.	9.	3.
18	C02	018	GIVE SPECIAL SHAMPOO	7	7.	7.	8.	3.
28	D07	028	THIN HAIR WITH RAZOR	7	7.	7.	8.	3.
46	F09	046	FROST HAIR	7	7.	6.	9.	3.
33	E03	033	MAKE PIN CURLS	7	8.	5.	7.	3.
41	F04	041	APPLY TEMPORARY RINSES	7	8.	5.	9.	3.
51	H01	051	CONDITION DAMAGED HAIR	7	7.	6.	8.	3.
20	C04	020	GIVE PLAIN WATER RINSE	7	6.	8.	7.	3.
44	F07	044	LIGHTEN HAIR	7	6.	7.	8.	3.
61	I05	061	COMB HAIRPIECES AND WIGS INTO STYLE	6	5.	8.	8.	3.
58	I02	058	CUT OR SHAPE WIGS AND HAIRPIECES	6	6.	7.	7.	3.
36	E06	036	BLOW-STYLE HAIR	6	7.	7.	7.	3.
48	F11	048	TIP OR STREAK HAIR	6	6.	6.	8.	3.
11	C02	011	FIX PERMANENT HAIR COLORS	6	8.	6.	8.	3.
60	L04	060	RENEW INDIVIDUAL COSMETOLOGY LICENSE	6	7.	5.	8.	3.
40	F03	040	APPLY SEMI-PERMANENT HAIR TINT	6	7.	4.	9.	3.
54	H04	054	TREAT DANDRUFF	6	6.	6.	7.	3.
25	D04	025	SLITHER HAIR	6	5.	7.	7.	3.
31	E01	031	GIVE A FINGER WAVE	6	6.	5.	8.	3.
19	C03	019	GIVE LIGHTENED HAIR	6	6.	5.	8.	3.
26	D05	026	SHINGLE HAIR	6	7.	4.	8.	3.
39	F02	039	APPLY HAIR TONERS	6	6.	5.	7.	3.
15	E00	015	PERFORM PRE SANITIZING PROCEDURE	6	6.	5.	7.	3.
21	C05	021	GIVE SPECIAL EFFECT RINSES	5	6.	5.	7.	3.
52	H02	052	MASSAGE SCALP MANUALLY	5	5.	6.	7.	3.
62	I06	062	SET WIGS AND HAIRPIECES	5	6.	4.	8.	3.
56	H06	056	TREAT OILY SCALP	5	7.	3.	9.	3.
55	H05	055	TREAT DRY SCALP	5	5.	6.	6.	3.
43	F06	043	REMOVE ARTIFICIAL COLOR					

COSMETOLOGIST

	Duty/ Task	Cum. No.	Task Description	Tutil	TS	TD	PM	YOJ
50	G02	050	PERFORM CHEMICAL RELAXATION OF HAIR	5	5.	6.	6.	3.
12	B03	012	MIX SHAMPOO	5	5.	5.	7.	3.
3	A03	003	ORDER SUPPLIES	5	5.	5.	6.	3.
57	I01	057	APPLY RINSES TO WIGS AND HAIRPIECES	5	5.	4.	7.	3.
60	I04	060	CLEAN WIGS AND HAIRPIECES WITH SHAMPOO	5	5.	4.	7.	3.
29	D08	029	THIN HAIR WITH THINNING SHEARS	5	6.	4.	8.	2.
4	A04	004	MAINTAIN CUSTOMER RECORDS	5	5.	4.	6.	3.
59	I03	059	CLEAN WIGS AND HAIRPIECES WITH CLEANING FLUID	5	5.	4.	6.	3.
78	L02	078	RECORD CUSTOMER SERVICES IN PERSONAL FILE	5	5.	4.	6.	3.
79	L03	079	RECORD NEEDED SUPPLIES	5	5.	4.	6.	3.
2	A02	002	ORDER EQUIPMENT	5	4.	5.	5.	3.
74	K05	074	TINT EYEBROWS	4	4.	5.	5.	3.
63	I07	063	FIT WIGS	4	4.	6.	4.	3.
13	B04	013	MIX WEEKLY RINSES	4	5.	3.	6.	3.
73	K04	073	ARCH EYEBROWS	4	5.	3.	6.	3.
14	B05	014	MIX SETTING LOTIONS	4	5.	4.	4.	3.
10	B01	010	MIX CREAM RINSE	4	5.	2.	7.	3.
75	K06	075	TINT EYELASHES	4	4.	5.	3.	3.
37	E07	037	PRESS HAIR WITH HEAT	4	4.	7.	2.	3.
38	F01	038	PERFORM SKIN SENSITIVITY TEST	4	5.	2.	5.	3.
7	A07	007	KEEP EMPLOYEE WORK RECORDS	4	4.	6.	2.	3.
32	E02	032	GIVE A MARCEL WAVE	4	4.	6.	2.	3.
64	J01	064	SET UP MANICURE STATION	4	4.	3.	4.	3.
65	J02	065	GIVE PLAIN MANICURE	4	4.	3.	4.	3.
1	A01	001	MAKE WORK ASSIGNMENTS	4	4.	4.	3.	3.
8	A08	008	BRIEF NEW EMPLOYEES ON PROCEDURES	3	4.	4.	3.	3.
77	L01	077	PREPARE CHARGE-SLIPS FOR CUSTOMERS	3	4.	4.	3.	3.
5	A05	005	PROMOTE OR DISMISS EMPLOYEES	3	3.	6.	2.	3.
16	B07	016	SANITIZE EQUIPMENT WITH FORMALDEHYDE TABLETS OR SOLUTIONS	3	7.	5.	1.	3.
9	A09	009	CONDUCT TRAINING OF APPRENTICES	3	3.	8.	1.	3.
47	F10	047	PAINT HAIR	3	4.	2.	3.	3.
30	D09	030	SINGE HAIR	3	3.	3.	2.	3.
67	J04	067	MAKE NAIL REPAIR	3	3.	3.	2.	3.
70	K01	070	GIVE PLAIN FACIAL	3	3.	3.	2.	3.
71	K02	071	APPLY FACIAL PACK	3	3.	3.	2.	3.

ALABAMA PROJECT 1125

COSMETOLOGIST

	Duty/ Task	Cum No.	Task Description	Tutil	TS	TD	PM	YOJ
72	KC3	072	APPLY MAKE-UP TO MAXIMIZE CUSTOMERS: FEATURES	2	3.	6.	1.	3.
6	A06	006	EVALUATE EMPLOYEES: DRESS	2	4.	2.	2.	3.
66	J03	066	GIVE OIL MANICURE	2	4.	2.	2.	3.
76	K07	076	APPLY PERMANENT LASHES	2	3.	5.	1.	3.
53	H03	053	MASSAGE SCALP WITH VIBRATOR	2	3.	3.	1.	3.
69	J06	069	GIVE PEDICURE	2	3.	2.	1.	2.
68	J05	068	SET UP PEDICURE STATION	1	3.	1.	1.	2.

NOTE: Tutil - Total Utility Converted to a Stanine Value
TS - Time Spent Index
TD - Task Difficulty Index
PM - Performing Members Converted to a Stanine Value
YOJ - Time Range on the Job

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APPENDIX B

DEFINITIONS OF THE HANDICAPPED TARGET GROUPS STUDIED

DEFINITIONS OF HANDICAPPED
TARGET GROUPS USED BY V-TECS

I. ALABAMA

Paraplegic: Those individuals confined to a wheel chair because of having lost use of the lower extremities.

II. FLORIDA

Deaf: Those individuals whose hearing disability was present at birth or occurred early in life at an age prior to the emergence of speech or language (0-2 years) and who cannot learn language through hearing with or without a hearing aid. It is assumed that, in developing a lesson plan, the instructor will revise the language used in the catalog where necessary to assure that it is understandable by the deaf.

III. GEORGIA

Hearing Impaired: Persons who, because of a hearing loss, must function primarily on a visual rather than an auditory level but are capable of communicating and receiving instruction through reading, lip reading, or sign language. In implementing the catalog, it is assumed that the language used in communicating classroom instruction and/or on-the-job training will be adapted to suit the needs of the individual.

IV. KENTUCKY

Educable Mentally Retarded: Those individuals having a rate of intellectual development from 50 percent to 75 percent of normal intellectual growth based upon standardized

Educable Mentally Retarded (Continued)

individual intelligence tests such as WAIS, WISC, etc., and who require specialized supportive services in areas such as recruitment and referral, scheduling modification, special equipment, special curriculum materials, psychological services, job placement, guidance and counseling, and transportation. (Reference: The Kentucky Handbook for Planning and Evaluating Local Vocational Education, State Department of Education, Frankfort, Kentucky 40601, pp. M-2 and M-10).

For purposes of this study, the EMR group is broken down as follows:

a) Lower-level EMR's - those individuals having a rate of intellectual development from 50 percent to 60 percent of normal intellectual growth.

b) Upper-level EMR's - those individuals having a rate of intellectual development from 60 percent to 75 percent of normal intellectual growth.

V. MISSISSIPPI:

Educable Mentally Retarded: Those individuals who are functioning intellectually and/or socially, emotionally, motorically, and perceptually at a level of 50 percent to 75 percent of the average based upon tests such as WAIS, WISC, VINELAND, etc. Excluded from this category are those individuals whose primary handicap is a specific learning disability, sensory, or crippling condition.

VI. VIRGINIA

One Arm Missing: Those individuals having only one usable hand and arm. Impairment of the nonusable hand and arm may be due to amputation, birth defect, etc. It is assumed that no prosthesis is used and that the individual has adapted to any switching needed to compensate for the impairment.

APPENDIX C

BACKGROUND INFORMATION ON THE HANDICAPPED
/ORKERS PARTICIPATING ON THE COMMITTEES

DESCRIPTIONS PROVIDED OF THE HANDICAPPING CONDITIONS
OF THE WORKERS SELECTED TO SERVE
ON THE STATE COMMITTEES

State	Incumbent Worker
Alabama	Paraplegic - confined to a wheelchair
Florida	Deaf - cannot communicate through speech; quite proficient in lip reading.
Georgia	Deaf - lost hearing at 18 months; quite proficient in lip reading and comprehending written material; can communicate some words through speech.
Kentucky	Educable Mentally Retarded.
Mississippi	Educable Mentally Retarded.
Virginia	One Arm Missing - left arm amputated above the elbow.

APPENDIX D

RESPONSES TO QUESTION 5: PART II
OF THE "BACKGROUND INFORMATION FORM"

QUESTION: What types of handicapping conditions are you you most knowledgeable about?

RESPONSES:

Alabama

- Paraplegic
- Skeletal abnormalities
- Physical
- Crip and health impaired/mentally retarded
- EMR, TMR, physical
- Physical
- Amputee, mentally handicapped

Florida

- Deaf-mentally retarded
- Deaf, M.R. orthopedic cardiac
- Deaf, hard-of-hearing, speech handicapped
- Deafness

Georgia

- Most physical and some mental
- Orthopedic and psychiatric
- Emotional, mental retardation, brain damage primarily--some experience with deaf and hard-of-hearing and orthopedically handicapped
- Hearing impaired, speech impaired, learning disabled
- Deaf
- Physical
- Physical, hard-of-hearing, emotionally disturbed, visually handicapped, crippled, speech impaired
- Hearing, but hesitate to use the word "most"
- Physical, hard-of-hearing, emotionally disturbed, visually handicapped, crippled, speech impaired

Kentucky

- EMR-Deaf-Blind
- Educable and Trainable Mentally Retarded
- Educable Mentally Handicapped
- General knowledge, but probably more oriented to physical handicaps

Kentucky (Continued)

- EMR's
- Limited knowledge in relation to all handicapping conditions

Mississippi

- TMR, EMR, and physically handicapped
- All handicap
- EMR, and learning disabled, general caseload and sheltered workshop
- Deaf, blind, EMR

Virginia

- Mentally retarded and emotionally disturbed-work all areas of handicapped
- Physical
- Cardiovascular, mental retardation, orthopedic, deafness
- Amputees and paraplegic
- EMR and TMR, blind and deaf
- All types of physical and mental handicapping conditions
- Most of them
- C.P.; amputees, cord injured and multiple disabled

APPENDIX E

RESPONSES TO QUESTION 3: PART III
OF THE "BACKGROUND INFORMATION FORM"

QUESTION: In completing your committee work, what procedures did you use, if any, to acquire additional information about the occupational area and/or the specific handicapped target population. (Briefly list backgrounds of persons consulted, on-site visits, references used, etc., and for what purpose).

RESPONSES:

Alabama

- Went to Douglas McArthur Technical College.
- Consulted training officers; incumbent workers and supervisors.
- Contacted Vocational Educational Specialist in content area; library research in area of radio/tv repair; conferences with other SDE staff (who didn't know either).
- Curriculum Specialist Vocational Rehabilitation people.
- SPAIN Rehabilitation Center; BITTAM Rehabilitation Center for spinal cord injuries.
- Incumbent workers; media specialist; training supervisor specialist in rehabilitation training.

Florida

- Attended workshop at General Motors with seven other Auto Body Instructors from Vocational-Technical schools around the state.
- Interviewed two agencies with body repair shops.
- Spoke with deaf persons.

Georgia

- Consulted with Vocational-Technical Education teacher who provided education for deaf. Talked with other Vocational Rehabilitation Counselors with similar background.
- Visited computer center to watch operator at work.
- Consulted with rehabilitation counselor specializing in hearing impaired - conclusion: frustrations would be minimal in this type of work for hearing impaired and emotional adjustment satisfactory.
- Two employees of DOAS, computer services, completed occupational inventories.
- Occupational Inventories:
  (1) Observed computer operator at large bank.
  (2) Discussed most items with VR Counselor for deaf from Kentucky and North Carolina.
- Used Vocational Rehabilitation Counselor as a specialist on handicapped persons; two assumptions were made in rating process:

QUESTION: (Continued) In completing your committee work what procedures did you use, if any, to acquire additional information about the occupational area and/or the specific handicapped target population.

Georgia (Continued)

(1) All "materials supplied" are in such a manner as not to hinder population.

(2) All job specifications and directions are in such a manner as not to hinder population.

- Utilized own background and knowledge 10 years working with instructional data processing and D & H instructors and students.

- None, except that I am very familiar with the Occupational Inventory and Performance Objectives as one of the authors.

- Utilized 18 years experience working with disadvantaged and handicapped instructors and students.

Kentucky

- Observed a regular cashier class one hour three times. Discussed Occupational Inventory with two cashier teachers for their reactions. Read four (parts of) reference books on EMR's.

- None, strong background in working with EMR. Also, former cashier-checker.

- Four year's experience in a grocery/super market.

- Some discussion regarding the specific handicapped target population as to functional capacities with vocational rehabilitation counseling staff in special school projects in Jefferson County, Kentucky.

- Observed a cashier/checker in operation performing some of the tasks we were associated with. Consulted Dr. Marvin Holmes (Special Education) on ideas, concerning EMR's. He taught secondary level EMR's for seven years.

- Visited a mobile unit for post-secondary students in distributive education. Observed cashier/checkers at local grocery.

- Worked with individual with experience in dealing with EMR and also knowledge in cashier/checking.

Mississippi

- J.L. Combest - M.S. in Agriculture Education, teacher of Vocational Agriculture for 19 years, three years with EMR in Special and Vocational Education.

- I have taught parts of Unit 15 years in secondary schools to all classes of students. I was assistant state supervisor of Vocational Agriculture for eight years and have been directly involved as State Supervisor of programs for handicapped students for seven years. Made on-site visits to handicapped students studying the subject in two programs.

QUESTION: (Continued) In completing your committee work what procedures did you use, if any, to acquire additional informaiton about the occupational area and/or the specific handicapped target population.

Virginia

- Observed office personnel in performance of duties. Attempted some tasks using only one hand.

- Consulted with wife (she is secretary) and has experience with handicapped individuals.

- Former Business Education teacher - Distributive Education Teacher Coordinator. Did not need to seek answers for tasks, but it was necessary for me to assume that I had a handicapping condition. Most tasks can be performed. "The job we have to do is to sell this to employers, Department of Labor, etc."

- None except our own Business Education Department at Woodrow Wilson Rehabilitation Center.

- None.

APPENDIX F

LETTER OF INVITATION TO THE CONFERENCE/SYMPOSIUM

SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS
795 Peachtree Street, N.E. - Atlanta, Georgia 30308
Phone 875-8011 Area Code 404

March 4, 1976

Dear (State Director of Vocational Education):

The Southern Association of Colleges and Schools was provided a grant by the U.S. Office of Education, Bureau of Vocational Education, to be used by V-TECS for the refinement and further development of our computer system and for conducting basic research concerning the applicability of job-based performance objectives to selected target groups of handicapped learners. This project is nearing completion and is in the state of final report preparation.

One part of the project is the conducting of a Conference/Symposium on the findings and results of this twenty-one month study. We want to take this opportunity to extend, to your V-TECS Technical Coordinator and a person who has prime statewide responsibility for vocational education of handicapped learners, an invitation to attend a one-day Conference/Symposium to be held in Atlanta, Georgia, on March 26, 1976. Funds are available to pay the expenses of these persons. Of course, we will welcome others who may wish to attend at your state's expense.

Please complete and return the enclosed cards, so that we may make the necessary room reservations and send copies of the Agenda to the appropriate persons.

If you have questions, please call or write.

Sincerely,

Ben A. Hirst, Jr., Executive Director
Vocational-Technical Education
Consortium of States

BAH/bbh
Enclosures

cc: (V-TECS Board Member)
(V-TECS Technical Coordinator)

APPENDIX G

AGENDA AND MINUTES OF THE CONFERENCE/SYMPOSIUM

SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS

795 Peachtree Street, N.E. . Atlanta, Georgia 30308

Phone 875-8011 Area Code 404

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION INSTITUTIONS
CONFERENCE/SYMPOSIUM
RESULTS OF U.S. OFFICE OF EDUCATION PROJECT FY75

ROYAL INN
ATLANTA, GEORGIA
MARCH 26, 1976

A G E N D A

FRIDAY, MARCH 26, 1976

9:30 A.M. - BEGIN CONFERENCE/SYMPOSIUM

. ANNOUNCEMENTS AND INTRODUCTIONS

. OVERVIEW OF V-TECS

Ben A. Hirst, Jr.

. FROM TASK STATEMENTS TO FINAL CATALOG

Bill Koscheski

. QUESTIONS AND ANSWERS

Connie Lee

. OBJECTIVES AND SCOPE OF THE U.S.O.E. PROJECT

Ben A. Hirst, Jr.

LUNCH

. COMPUTER SYSTEMS DEVELOPMENT

Tony M. Hinson

. APPLICABILITY OF V-TECS MATERIALS TO SELECTED HANDICAPPED LEARNERS

Connie Lee

. RECOMMENDED PROCEDURE FOR CONDUCTING FUTURE APPLICABILITY STUDIES FOR HANDICAPPED LEARNERS

Connie Lee

. SUMMARY OF THE SYMPOSIUM

Ben A. Hirst, Jr.

. QUESTIONS AND ANSWERS

ADJOURN

MINUTES

CONFERENCE/SYMPOSIUM

RESULTS OF U.S. OFFICE OF EDUACATION PROJECT FY75

March 26, 1976
Royal Inn
Atlanta, Georgia

V-TECS PRESENTERS

Ben A. Hirst, Jr., Executive Director
Billy J. Koscheski, Technical Consultant, Product Development Services
Tony M. Hinson, Technical Consultant, Computer Systems & Services
Connie Lee, Technical Consultant, Research Services

PERSONS ATTENDING

Alabama - R. A. Markham
Delaware - Bill Kistler
Pat Stetson
Florida - Wally Hunter
Thomas Swift
Georgia - Milton Adams
Bettye Hirst
Don Hogan
Robert Mabry
LeRoy Netrick
Jim Perry
Indiana - Tom Garrison
Kentucky - Art Craig
Louisiana - Harry Boyer
Maryland - William Michel
Ruth C. Brown
Mississippi - W. T. Taylor
Edward L. Thomas
South Carolina - Bob Benson
Albert L. Lester
Tennessee - Harold Gregory
Virginia - Dale Oliver

MORNING ACTIVITIES

Dr. Ben A. Hirst, Jr., called the meeting to order and explained the procedures for payment of expenses. Following introductions, a slide/tape presentation entitled, "This is V-TECS" was shown. With the aid of transparencies, Ben Hirst gave an overview of V-TECS discussing the initial development and current procedures and accomplishments to date.

Bill Koscheski traced a task from its initial development to inclusion in the final catalog, emphasizing the selection criteria applied for inclusion. A handout entitled, "From Task Statements to Final Catalog" accompanied his presentation. No questions were asked.

Ben Hirst gave a brief overview of the objectives and scope of the U.S.O.E. Project.

AFTERNOON ACTIVITIES

Dr. Tony Hinson gave an overview of computer system developments from July 1, 1973, to the present. Transparencies were presented on each of the 14 standard computer reports. Additional transparencies were presented illustrating

the use of the task difficulty index, time spent index, and stanine values. Also, an example of the Bayesian Statistical Report was presented along with its advantages. Implementation of this report is pending approval by the V-TECS Board of Directors.

Tony Hinson noted that by mid-June of this year, the V-TECS Central Office will be storing and retrieving V-TECS catalogs on the cathode ray tube and computer printer using Campbell's Format (dissertation style). He also noted that when this procedure is approved by the V-TECS Board, no final catalog keypunching will be necessary.

Dr. Connie Lee discussed the overall design and conduct of the feasibility study of applicability of V-TECS catalogs to selected target groups of handicapped learners. Several transparencies were presented covering the V-TECS catalogs and handicapped target groups selected for study, the dates of the state committee meetings, and the composition of each state committee in terms of the work experience and areas of expertise of the committee members. She noted that, due to the small sample sizes, no comparisons could be made between background variables and catalog ratings.

Connie Lee then discussed in detail the procedures and instruments used and the results and findings of the feasibility study. She presented transparencies summarizing the time spent rating the tasks in the occupational inventories and the performance objectives in the catalogs, and the number and percentage of performance objectives rated applicable to the selected handicapped target groups. A handout was provided listing each of the performance objectives rated unattainable or attainable under certain conditions and the associated comments from each state committee. It was noted that the rating of tasks in the occupational inventory provided a minimal of information relative to needed revisions.

During the discussion of findings, several comments and concerns were expressed. The Florida V-TECS Technical Coordinator commented that one committee member was teaching a course and, thus, had to spend more time than the other Florida committee members in completing the committee work. The Georgia V-TECS Technical Coordinator noted that several committee members from Georgia chose to work in pairs to complete the ratings - one pair having more knowledge

of the occupation and the other having more experience working with the handicapped. The Technical Coordinator suggested that this procedure might be recommended for future committees. A Special Programs Specialist from Maryland expressed some concerns about the definitions of EMR's used during the study and about the fact that no concensus was reached on the ratings.

Connie Lee responded to the above comments. She stated that the possibility of committee members working in teams was stressed in the recommended procedures for conducting future applicability studies. She explained the process used to derive definitions of the handicapped target groups and stated that, for coding purposes, V-TECS would have to establish specific definitions of each handicapped target group to be used by all states desiring to conduct future applicability studies using V-TECS products. It was emphasized that the specific ratings for each performance objective would not be widely disseminated due to the fact that this was only a feasibility study. Future studies would have to provide for a concensus meeting to iron out major discrepancies in the ratings.

Connie Lee concluded that the committee approach was a viable approach for determining applicability of V-TECS catalogs to handicapped learners. She discussed and passed out a recommended procedure for conducting future studies. The procedure consisted of 12 major steps with an accompanying narrative discussion of key points. She mentioned that an interim project report had been prepared and was available and that a final project report would be available in late April.

In summary of the conference/symposium, Ben Hirst commented that a great deal had been accomplished as a result of U.S.O.E. funding. He stated that all states involved in developing curriculum in vocational education for all learners, including the handicapped, could benefit greatly from the results of this project. He commended Dr. Tony Hinson and Dr. Connie Lee for the excellent work they did in carrying out the objectives of this Project.

RECORDING SECRETARY

Mary Tschopp - V-TECS Secretary